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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference SK252WO	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/JP2003/012045	International filing date (day/month/year) 22 September 2003 (22.09.2003)	Priority date (day/month/year) 18 November 2002 (18.11.2002)
International Patent Classification (IPC) or national classification and IPC G02F 1/1339		
Applicant SEKISUI CHEMICAL CO., LTD.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒ Box No. I Basis of the report

☐ Box No. II Priority

☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

☐ Box No. IV Lack of unity of invention

☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

☐ Box No. VI Certain documents cited

☐ Box No. VII Certain defects in the international application

☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 26 April 2004 (26.04.2004)	Date of completion of this report 25 August 2004 (25.08.2004)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2003/012045

Box No. 1 Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language _____, which is language of a translation furnished for the purpose of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

- ☒ The international application as originally filed/furnished
- ☐ the description:
- pages _____, as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the claims:
- pages _____, as originally filed/furnished
- pages* _____, as amended (together with any statement) under Article 19
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the drawings:
- pages _____, as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP03/12045

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-2	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-2	NO
Industrial applicability (IA)	Claims	1-2	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

- Document 1: JP, 2000-288451, A (DAINIPPON PRINTING CO., LTD.), 17 October 2000 (17.10.00), full text, all drawings
- Document 2: JP, 11-281985, A (ASAHI GLASS CO., LTD.), 15 October 1999 (15.10.99), full text, all drawings
- Document 3: JP, 2001-51280, A (UBE-NITTO KASEI CO., LTD.), 23 February 2001 (23.02.01), full text, all drawings
- Document 4: JP, 2000-246887, A (DAINIPPON PRINTING CO., LTD.), 12 September 2000 (12.09.00), full text, all drawings & US, 6280799, B1

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of Box V:

Claims 1~2

The subject matter of claims 1~2 does not involve an inventive step on account of documents 1~4 cited in the ISR.

Document 1 (in particular, [0017]) describes a method for producing a liquid crystal display in which the nozzle aperture is $10R$ (μm) or larger.

Document 2 (in particular, claim 3) describes a method for producing a liquid crystal display in which the surface tension of the spacer dispersion liquid is $35\sim 50$ dyn/cm (mN/m).

Document 3 (in particular, claim 2) describes a method for producing a liquid crystal display in which the contact angle θ of the spacer dispersion liquid with the substrate surface is 50 degrees or less.

Document 4 (in particular, Par. No. [0014]) says that dot size is about 5~6 times larger than the diameter of the nozzle aperture. Therefore, in order to prevent adjacent dots from touching, based on documents 1 and 4 it is necessary that $D \geq 50R\sim 60R$.

Now, the right side of equation (1) described in claim 1 is a monotonically decreasing function with θ in the range of $30\sim 90$ degrees, so if we substitute $\theta = 30$ degrees, $D \geq 94.1 \times R^{1/3}$.

Also, the particle size of the spacer generally used in a liquid crystal display is $R \geq 3 \mu\text{m}$, so the relationship $D \geq 50R\sim 60R \geq 94.1 \times R^{1/3}$ is satisfied.

Therefore bombardment so as to satisfy the relationship of the equation (1) described in claim 1 is a mere design matter to be appropriately practiced by a person skilled in the art.

The methods for producing a liquid crystal display described in documents 1~4 belong to closely related technical fields, so the invention of claims 1~2 could easily be conceived by a person skilled in the art.